Amendments to the Claims:

This listing of the claims will replace all prior versions, and listings, of the claims in the application:

---

1. (Currently Amended) An optical inspection system for inspecting an object, comprising:

a plurality of cameras for imaging the object, each of the plurality of cameras being asynchronously triggerable;

an illumination system for providing a plurality of lighting modes to illuminate the object for the plurality of cameras;

a frame grabber unit for transmitting image data from the plurality of cameras to a memory; and

a main computer for controlling image acquisition of the object,

wherein the plurality of cameras are adapted to obtain image data of the object based upon a plurality of fields of view of the object and a series of firing positions within each field of view, each of the firing positions having associated therewith at least one of the plurality of cameras and ~~a first~~at least one of the plurality of lighting modes provided by the illumination system, wherein the optical image system is adapted to image a first one of the plurality of fields of view of the object with the at least one of the plurality of cameras in first and second ones of the plurality of lighting modes in a single pass.

2. (Canceled)

3. (Original) The system according to claim 1, wherein image data provided by the plurality of cameras is sent to the memory concurrently.

4. (Original) The system according to claim 3, wherein the memory is main memory that is directly accessible by the main computer.

5. (Original) The system according to claim 1, wherein the plurality of cameras includes at least four cameras.

6. (Original) The system according to claim 1, wherein the object is a printed circuit board.

7. (Original) The system according to claim 1, wherein the frame grabber unit includes a plurality of DMA channels for storing data in the memory, which is directly accessible by the main computer.

8. (Original) The system according to claim 1, wherein the frame grabber unit includes at least one image acquisition board having a plurality of DMA channels for transmitting image data from at least two of the plurality of cameras to the memory, which is directly accessible by the main computer.

9. (Original) The system according to claim 1, further including a movable head assembly to which the plurality of cameras are secured and a position encoder for providing position information of the head assembly.

10. (Currently Amended) The system according to claim 9, wherein a velocity of the head assembly ~~can be~~is ~~adjusted~~ adjustable to minimize inspection time of the object.

11. (Currently Amended) The system according to claim 1, further including an event memory for storing firing position data, camera trigger data, and a lighting mode for each of the plurality of firing positions.

12. (Currently Amended) An optical inspection system for inspecting an object, comprising:

a plurality of triggerable cameras for imaging the object;

an illumination system for providing a plurality of lighting modes to illuminate the object for the plurality of cameras;

a main computer coupled to the plurality of cameras and the illumination system;

a frame grabber unit for receiving image data from the plurality of cameras, wherein the frame grabber unit includes at least one image acquisition board having a plurality of channels for transmitting image data from at least two of the plurality of cameras concurrently to main memory, which is directly accessible by the main computer, wherein each of the plurality of channels corresponds to a DMA channel.

13. (Currently Amended) The system according to claim 12, wherein ~~a first one of the plurality of cameras can~~the optical inspection system is adapted to image a first location on the object with a first one of the plurality of cameras in first and second ones of the plurality of lighting modes in a single pass over the ~~object~~first location.

14. (Canceled)

15. (Currently Amended) The system according to claim 12, wherein main memory ~~can~~ is adapted to store image data for more than one stripe.

16. (Original) The system according to claim 12, wherein the object is a circuit board.

17. (Currently Amended) A method of inspecting a circuit board, comprising:

selecting a speed for movement of a head assembly supporting a plurality of cameras with respect to the circuit board;

dividing the circuit board into field of views arranged in stripes, each ~~of which includes~~field of view including a plurality of firing positions;

for each of the plurality of firing positions, selecting at least one of a plurality of asynchronously triggerable cameras and a ~~first one of a~~ at least one of a plurality of lighting modes, wherein the optical inspection system is adapted to image a first location on the circuit board ~~can be imaged by a~~ with the ~~first~~ at least one of the plurality of cameras in first ~~second and third~~and second ones of the plurality of lighting modes in a single pass; and

transmitting image data from the plurality of cameras to memory.

18. (Original) The method according to claim 17, further including minimizing an inspection time of the circuit board from the head assembly speed, a number of lighting modes, and a number of passes over the circuit board required to image the circuit board.

19. (Original) The method according to claim 17, further including transmitting the image data to main memory that is directly accessible to a processor for analyzing the image data.

20. (Original) The method according to claim 19, further including transmitting the image data over a plurality of DMA channels.

21. (Original) The method according to claim 20, further including transmitting the image data from a plurality of cameras concurrently.

22. (Currently Amended) The method according to claim 17, further including imaging the circuit board in one pass over each stripe of the board, wherein at least one location on the board ~~must be~~is imaged in at least two different lighting modes.

23. (Currently Amended) A method of manufacturing a circuit board, comprising:

fabricating a printed circuit board;

populating the circuit board with components;

soldering the components to the circuit board to provide a circuit board assembly;

inspecting the circuit board assembly by

selecting a speed for movement of a head assembly supporting a plurality of cameras with respect to the circuit board;

dividing the circuit board into a plurality of field of views, each of which includes a plurality of firing positions;

for each of the plurality of firing positions, selecting at least one of a plurality of asynchronously triggerable cameras and ~~a first one of a~~ at least one of a plurality of lighting modes, wherein the method of manufacturing is adapted to image a first location on the circuit board ~~can be imaged by a~~with the ~~first~~ at least one of the plurality of

cameras in ~~second and third~~ first and second ones of the plurality of lighting modes in a single pass; and

transmitting image data from the plurality of cameras to memory.